DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
10903 New Hampshire Avenue
Document Control Center – WO66-G609
Silver Spring, MD 20993-0002

PREANALYTIX GMBH
C/O PASQUALE AMATO
STAFF SPECIALIST REGULATORY AFFAIRS
1 BECTON DRIVE
FRANKLIN LAKES, NJ 07417

September 9, 2015

Re: K142821
Trade/Device Name: PAXgene® Blood DNA Tube
Regulation Number: 21 CFR 862.1675
Regulation Name: Blood specimen collection device
Regulatory Class: II
Product Code: PJE
Dated: August 27, 2015
Received: August 28, 2015

Dear Pasquale Amato:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820); and if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

If you desire specific advice for your device on our labeling regulations (21 CFR Parts 801 and 809), please contact the Division of Industry and Consumer Education at its toll-free number (800) 638 2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Industry and Consumer Education at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/MedicalDevices/ResourcesforYou/Industry/default.htm.

Sincerely yours,

Katherine Serrano -S

For: Courtney H. Lias, Ph.D.
Director
Division of Chemistry and Toxicology Devices
Office of In Vitro Diagnostics
and Radiological Health
Center for Devices and Radiological Health

Enclosure

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration

Indications for Use

Form Approved: OMB No. 0910-0120
Expiration Date: January 31, 2017
See PRA Statement below.

510(k) Number *(if known)*
K142821

Device Name
PAXgene® Blood DNA Tube

Indications for Use *(Describe)*

The PAXgene Blood DNA Tube is intended to collect, anticoagulate, stabilize, transport, and store a venous whole blood sample for preparation of human DNA for use with molecular diagnostic test methods that require DNA.

The performance characteristics of this device have not been established for molecular diagnostic assays in general. Users must validate use of product for their specific molecular diagnostic assay.

Type of Use *(Select one or both, as applicable)*

☒ Prescription Use (Part 21 CFR 801 Subpart D) ☐ Over-The-Counter Use (21 CFR 801 Subpart C)

CONTINUE ON A SEPARATE PAGE IF NEEDED.

This section applies only to requirements of the Paperwork Reduction Act of 1995.

DO NOT SEND YOUR COMPLETED FORM TO THE PRA STAFF EMAIL ADDRESS BELOW.

The burden time for this collection of information is estimated to average 79 hours per response, including the time to review instructions, search existing data sources, gather and maintain the data needed and complete and review the collection of information. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden, to:

Department of Health and Human Services
Food and Drug Administration
Office of Chief Information Officer
Paperwork Reduction Act (PRA) Staff
PRAStaff@fda.hhs.gov

"An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB number."

510(K) SUMMARY
21 CFR 807.92(c)
PAXgene® Blood DNA Tube

Submitter Information	**Submitter Name:**	PreAnalytiX GmbH
	Submitter Address:	Feldbachstrasse Hombrechtikon, CH 8634
	Contact Person:	Pasquale Amato Staff Specialist Regulatory Affairs 1 Becton Drive, Franklin Lakes, NJ 07417 Phone: 201-847-4513 Email: Pasquale_Amato@bd.com
	Alternate Contact:	Alex Wesolowski Vice President, BDX Corporate/Shared Services Phone: 201-847-5051 Email: Alex_F_Wesolowski@bd.com
	Date of Preparation:	September 8, 2015
Device Information	**Trade Name:**	PAXgene® Blood DNA Tube
	Common Name:	Blood Collection Device
	Classification Name:	Blood Specimen Collection Device (21 CFR 862.1675)
	Classification:	Class II
	Product Code:	PJE
Predicate Device	**Trade Name:**	BD Vacutainer® PPT™ Plasma Preparation Tube
Device Description	The PAXgene® Blood DNA Tube is a sterile, single use, plastic, evacuated blood collection tube with a BD Hemogard™ closure assembly and a measured quantity of K_2EDTA additive. The additive quantity dispensed into each tube is designed to match the nominal blood draw volume of 2.5 mL. The tube is made of polyethylene terephthalate (PET) plastic which functions to maintain vacuum within the tube, allowing for accurate and consistent blood draw for the duration of the shelf life of the tube. A predetermined vacuum is drawn inside the tube that is sealed with a BD Hemogard™ closure which consists of a rubber stopper plus BD Hemogard™ shield.	

	The tube is intended to be placed inside a tube holder or an adaptor that contains a needle designed to pierce the tube closure and allow blood to flow into the tube. Once the vein has been penetrated (using either a standard blood collection needle or a blood collection set), the tube is pushed into the holder, and the blood enters the tube. Once a tube has drawn the appropriate amount of blood, it is disengaged from the holder and inverted the recommended number of times (8–10) to mix the additive with the blood. The DNA in whole blood collected in the PAXgene® Blood DNA Tube has been shown to be suitable for molecular diagnostic testing for 14 days at room temperature (18–25°C), 28 days refrigerated (2–8°C), 3 days at 35°C, up to 52 weeks frozen (−20°C), or when subjected to up to three freeze-thaw cycles. The PAXgene® Blood DNA Tube is robust with respect to mishandling including reduced inversions and partial blood draw. The product shelf life is one year from the date of manufacture including limited storage temperature excursions which simulate shipping conditions from −20°C to 45°C. The PAXgene® Blood DNA Tube is available as a 13 x 75 mm tube with a 2.5 mL nominal blood draw. The referenced first dimension represents the diameter of the tube and the second dimension represents the length of the tube.
Intended Use/Indications for Use	The PAXgene® Blood DNA Tube is intended to collect, anticoagulate, stabilize, transport, and store a venous whole blood sample for preparation of human DNA for use with molecular diagnostic test methods that require DNA. The performance characteristics of this device have not been established for molecular diagnostic assays in general. Users must validate use of product for their specific molecular diagnostic assay.
Technological Characteristics	The technological characteristics of the subject device, the PAXgene® Blood DNA Tube, are equivalent to that of the predicate device, the BD Vacutainer® PPT™ Plasma Preparation Tube with respect to device design and operating principle. The PAXgene® Blood DNA Tube utilizes identical component materials to the BD Vacutainer® PPT™ Plasma Preparation Tube. Aside from intended use/indications for use, the only changes are with the amount of K_2EDTA present in the tube and lack of gel barrier material. These differences do not raise any new questions of safety or effectiveness.

Summary Comparison between the PAXgene® Blood DNA Tube and Predicate Device:

Key Parameters	Subject/Evaluation Device	Predicate Device
	PAXgene® Blood DNA Tube	[510(k):k972075] BD Vacutainer® PPT™ Plasma Preparation Tube
Intended Use/Indications for Use	The PAXgene® Blood DNA Tube is intended to collect, anticoagulate, stabilize, transport, and store a venous whole blood sample for preparation of human DNA for use with molecular diagnostic test methods that require DNA. The performance characteristics of this device have not been established for molecular diagnostic assays in general. Users must validate use of product for their specific molecular diagnostic assay.	The Vacutainer® Brand PPT™ Plasma Preparation Tube with EDTA anticoagulant and a gel barrier material are evacuated blood collection tubes which provide a means of collecting, processing and transporting blood in a closed plastic tube. When the Tube is used together with Vacutainer® Brand Needles and Holders, it is a closed system for the collection of venous blood with the same indications identified here. Blood collected in a tube containing EDTA anticoagulant and gel barrier material is used primarily to provide undiluted plasma for use in molecular diagnostic test methods including but not limited to PCR (Polymerase Chain Reaction) and bDNA (branched DNA). The specimen may also be used for other testing that requires an undiluted plasma sample as determined by the laboratory.
Design/Function	Evacuated blood collection tube	Same
Dimensions	13 mm x 75 mm	13 mm x 100 mm / 16 mm x 100 mm
Nominal Draw Volume	2.5 mL	5.0 mL / 8.5 mL
Closure	BD Hemogard™ closure consisting of a rubber stopper plus BD Hemogard™ shield	Same
Anticoagulant	K_2EDTA	Same
Tube Material	Polyethylene terephthalate (PET)	Same
Tube Stopper Lubricant	Silicone	Same
Tube Sterility	Sterile	Same
Sterilization Method	Gamma irradiation	Same
Sterility Assurance Level	10^{-6}	Same
Shelf Life	12 months	Same
Injection Molding (Tube/Hemogard™ Closure)	Injection molded	Same
Rubber Molding (Stopper)	Compression molded rubber	Same
Interior Coating	Spray coated/Dried	Same
Evacuation	Vacuum chamber	Same
Shelf Pack Level	Shrink-wrapped expanded polystyrene (EPS) tray	Same
Shipper/Case Level	Corrugated cardboard	Same

Performance Characteristics	Clinical testing was performed on blood collected in both the subject and predicate devices with five (5) FDA cleared DNA based molecular diagnostic tests across four (4) external clinical test sites and one (1) internal test site. The test results demonstrated that the subject device performance was substantially equivalent to the legally marketed predicate device for the collection, anticoagulation, stabilization, transportation and storage of venous whole blood for the preparation of human DNA for use with molecular diagnostic test methods that required DNA.

Summary Results of Performance Testing:

1. Performance Characteristics of PAXgene Blood DNA Tube by Sample Preparation Method

DNA Yield, Concentration and Purity Summary

DNA yield, concentration and purity (A_{260}/A_{280}) were determined by UV absorbance for samples purified using both magnetic bead and silica membrane sample preparation technologies. Data from 581 specimens from approximately 200 consented subjects was used to support the performance characteristics of the PAXgene Blood DNA Tube with a commercially available, automated magnetic bead based DNA extraction kit. Data from 540 specimens from 152 consented subjects was used to support the performance characteristics of the PAXgene Blood DNA Tube with a commercially available, automated silica membrane based DNA extraction kit.

The following histograms and table summarize the DNA yield, DNA concentration and A_{260}/A_{280} ratio results obtained using the automated magnetic bead based DNA extraction kit (elution volume: 200 µl).

DNA Eluate Concentrations using an Automated, Magnetic Bead Bead-Based DNA Purification System

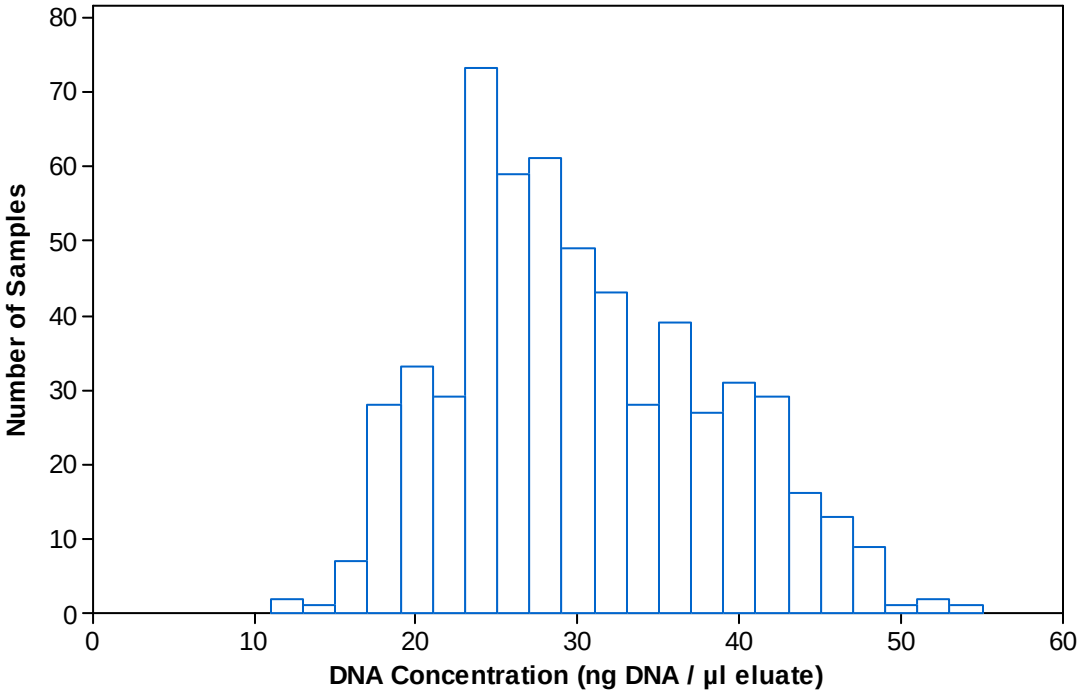

Figure 1

Blood was drawn from a donor pool of approximately 200 consented subjects ≥ 18 years of age into PAXgene Blood DNA Tubes. Tubes were processed within 24 hours at room temperature. Total DNA was purified from 581 specimens using a commercially available, automated magnetic bead based DNA extraction kit.

DNA Purity using an Automated, Magnetic Bead Bead-Based DNA Purification System

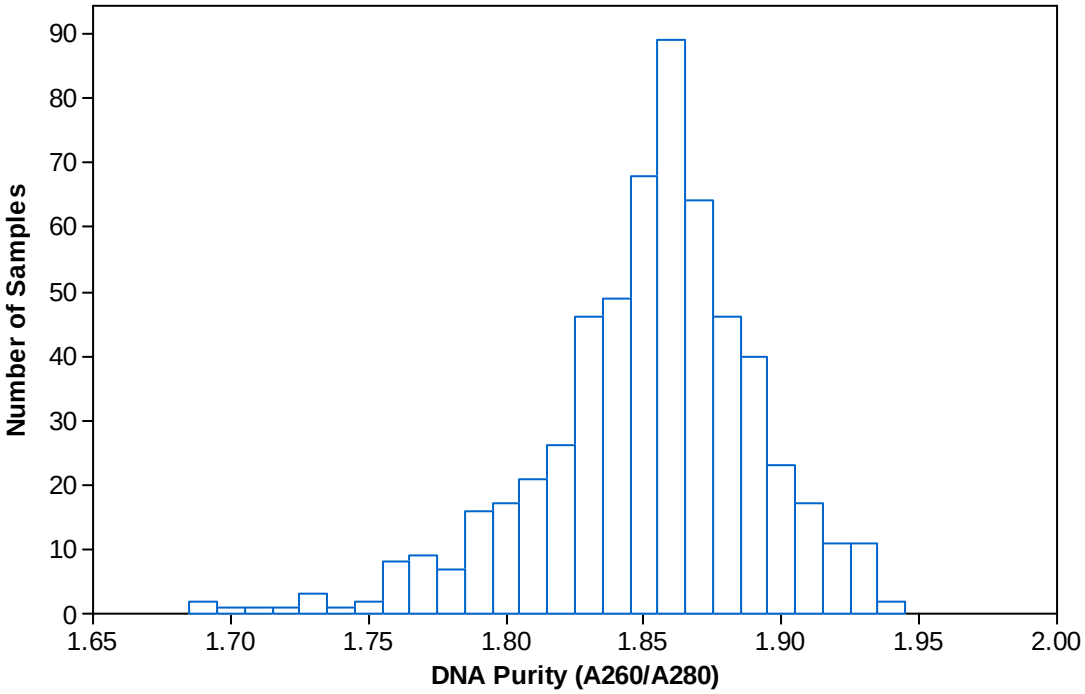

Figure 2

Blood was drawn from a donor pool of approximately 200 consented subjects ≥ 18 years of age into PAXgene Blood DNA Tubes. Tubes were processed within 24 hours at room temperature. Total DNA was purified from 581 specimens using a commercially available, automated magnetic bead based DNA extraction kit.

Table 1: Performance testing summary (magnetic bead based DNA purification)

	Yield (µg DNA / 200 µl blood)	**Concentration (ng DNA / µl eluate)**	**Purity (A_{260}/A_{280})**
n	581	581	581
Mean ± SD	6.05 ± 1.61	30.2 ± 8.0	1.85 ± 0.04
Median	5.77	28.9	1.86
Interquartile range	4.88–7.22	24.4–36.1	1.83–1.88
Range	2.43–10.79	12.2–54.0	1.69–1.94
95% of samples	≥ 3.64	≥ 18.2	1.75–1.93

The following histograms and table summarize the DNA yield, DNA concentration and A_{260}/A_{280} ratio results obtained using the automated silica membrane based DNA extraction kit (elution volume: 100 µl).

DNA Eluate Concentrations using an Automated, Silica Membrane-Based DNA Purification System

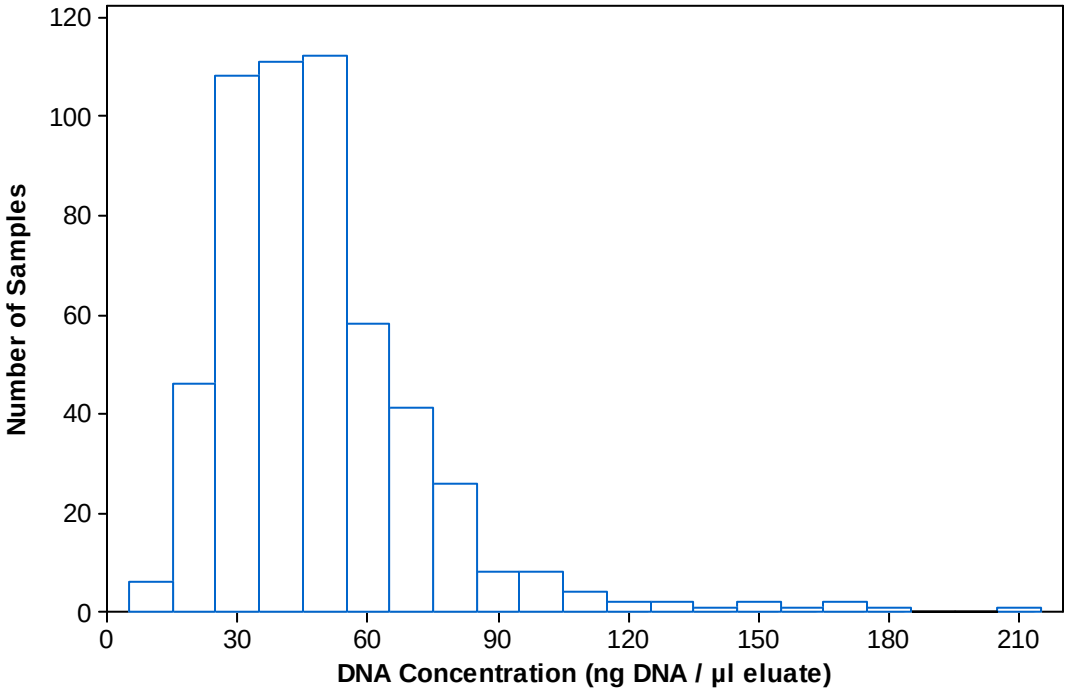

Figure 3

Blood was drawn from 152 consented subjects ≥ 18 years of age into PAXgene Blood DNA Tubes. Tubes were stored at room temperature for ≤ 14 days. Total DNA was purified from 540 specimens using a commercially available, automated silica membrane based DNA extraction kit.

DNA Purity using an Automated, Silica Membrane-Based DNA Purification System

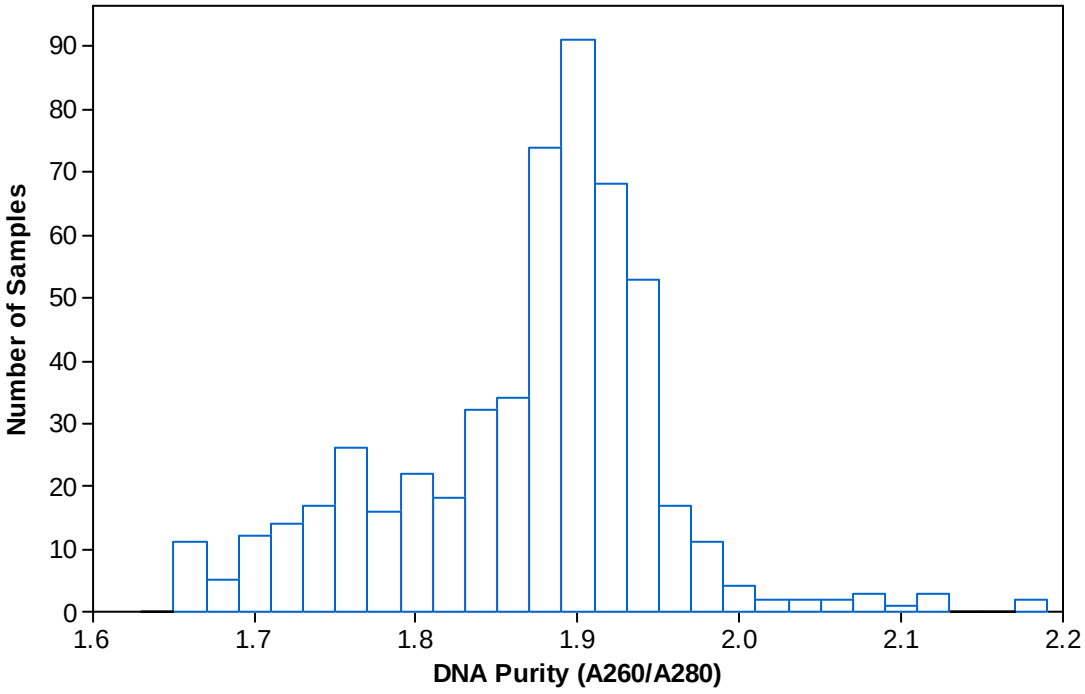

Figure 4

Blood was drawn from 152 consented subjects ≥ 18 years of age into PAXgene Blood DNA tubes. Tubes were stored at room temperature for ≤ 14 days. Total DNA was purified from 540 specimens using a commercially available, automated silica membrane based DNA extraction kit.

Table 2: Performance testing summary (silica membrane based DNA purification)

	Yield (µg DNA / 200 µl blood)	**Concentration (ng DNA / µl eluate)**	**Purity (A_{260}/A_{280})**
n	540	540	540
Mean ± SD	4.89 ± 2.48	48.85 ± 24.75	1.86 ± 0.08
Median	4.49	44.90	1.88
Interquartile range	3.27–5.71	32.73–57.10	1.81–1.92
Range	0.75–21.1	7.46–211.10	1.65–2.19
95% of samples	≥ 1.86	≥ 18.56	1.67–2.06

2. Performance Characteristics of PAXgene Blood DNA Tube by Molecular Diagnostic Test Methods

Evaluations of the PAXgene Blood DNA Tube have been performed for selected FDA cleared assays on certain instrument platforms. See Table 3 for sample preparation, instrument, and assay information.

Table 3: Assay and DNA Sample Preparation Information:

Assay	**Cystic Fibrosis Assay**	**HLA Assay 1**	**Thrombophilia Assay**	**HLA Assay 2**	**HLA Assay 3**
Assay instrument	Multiplex fluorescent microsphere based flow cytometry	Multiplex fluorescent microsphere based flow cytometry	Electrochemical detection based DNA microarray	N/A, gel-based readout	N/A, gel-based readout
DNA isolation kit and instrument technology	Silica membrane	Silica membrane	Silica membrane	Magnetic bead	Magnetic bead and silica membrane

The performance of the PAXgene Blood DNA Tube was assessed relative to an EDTA tube control using FDA cleared molecular diagnostic assays. Assays were evaluated at either 1 or 3 sites. See Table 4 and Table 5 for testing results:

Table 4: Test Results by Site:

Site	**Assay**	**Samples tested**	**Correct calls**	**Incorrect calls**	**No-calls**	**% Correct calls**	**95% CI lower bound**
Site A	CF Assay	40	40	0	0	100%	91.2%
	HLA Assay 1	40	40	0	0	100%	91.2%
Site B	CF Assay, After Retesting†	37	36	0	1	97.3%	86.2%
	HLA Assay 1*	40	40	0	0	100%	91.2%
Site C	CF Assay	40	40	0	0	100%	91.2%
	HLA Assay 1, After Retest*‡	40	40	0	0	100%	91.2%
Site D	Thrombophilia	80	80	0	0	100%	95.2%
Site E	HLA Assay 2, After Retest§	698	698	0	0	100%	99.5%
	HLA Assay 3	100	100	0	0	100%	96.3%

* In addition to the two-field concordance presented in the table, probe hit patterns were analyzed and a total of 7 probes out of 14,400 (200 comparisons × 72 probes) were found to be discordant. The overall probe concordance was 99.95% with a 95% CI lower bound of 99.9%.

† CF Assay, after retest, includes 1 sample from Site B showing a result of "No Call" that was not retested. Three previous runs at Site B included up to 38 samples showing a result of "No Call" due to a degraded enzyme in the CF Assay Kit. Run 4 used a new enzyme to perform the test at Site B. The results exclude 3 subjects from Site B where the assay was not repeated for 3 evaluation tubes.

‡ HLA Assay 1, after retest, includes 4 samples from Site C that were re-extracted and retested due to a labeling error.

§ HLA Assay 2, after retest, includes 2 repeat testing samples due to labeling errors and removes 12 samples (3 concordant with previous results, 9 discordant with previous results due to labeling errors) that could not be retested.

Table 5: Test Results by Study:

Objective	Sites	Assay	Samples tested	Correct calls	Incorrect calls	No-calls	% Correct calls	95% CI lower bound
Site-to-site reproducibility	A, B, C	CF Assay	20	20	0	0	100%	N/A
	A, B, C	HLA Assay 1*	20	20	0	0	100%	N/A
Lot-to-lot variation	A	CF Assay	20	20	0	0	100%	N/A
	A	HLA Assay 1	20	20	0	0	100%	N/A
Tube performance	A, B, C	CF Assay, After Retest†	117	116	0	1	99.1%	95.3%
	A, B, C	HLA Assay 1, After Retest*‡	120	120	0	0	100%	96.9%
	D	Thrombophilia Assay	80	80	0	0	100%	95.4%
	E	HLA Assay 2, After Retest§	698	698	0	0	100%	99.5%
Interference	E	HLA Assay 3	100	100	0	0	100%	96.3%

* In addition to the two-field concordance presented in the table, probe hit patterns were analyzed and a total of 7 probes out of 14,400 (200 comparisons × 72 probes) were found to be discordant. The overall probe concordance was 99.95% with a 95% CI lower bound of 99.9%.

† CF Assay, after retest, includes 1 sample from Site B showing a result of "No Call" that was not retested. Three previous runs at Site B included up to 38 samples showing a result of "No Call" due to a degraded enzyme in the CF Assay Kit. Run 4 used a new enzyme to perform the test at Site B. The results exclude 3 subjects from Site B where the assay was not repeated for 3 evaluation tubes.

‡ HLA Assay 1, after retest, includes 4 samples from Site C that were re-extracted and retested due to a labeling error.

§ HLA Assay 2, after retest, includes 2 repeat testing samples due to labeling errors and removes 12 samples (3 concordant with previous results, 9 discordant with previous results due to labeling errors) that could not be retested.

3. Reproducibility

Two reproducibility studies were performed.

1. The site-to-site reproducibility study was conducted at three sites. Three tubes from one lot were collected from each of 20 donors and sent to 3 different sites for DNA extraction and testing. DNA was extracted using a commercially available, automated silica membrane based DNA extraction kit, followed by determination of DNA concentration and purity for all samples. All samples were tested using the CF Assay and HLA Assay 1 for concordance. All samples gave 100% concordant results.

2. The lot-to-lot device reproducibility study was conducted at three sites. One tube from each of 3 lots was collected from each of 20 donors and sent to one site for DNA extraction and testing. DNA was extracted using a commercially available, automated silica membrane based DNA extraction kit, followed by determination of DNA concentration and purity for all samples. All samples were tested using the CF Assay and HLA Assay 1 for concordance. All samples gave 100% concordant results.

4. Product stability – Shelf Life Study

Product shelf life was evaluated by storing unused devices at room temperature for up to 13 months, with and without temperature cycling for 10 days at 45°C and 5 days at −20°C to simulate temperature extremes in transport. DNA was purified using a commercially available, automated magnetic bead based DNA extraction kit and samples were tested for DNA yield, concentration and purity, as well as HLA Assay 2 concordance with a control EDTA tube.

The data supports a product shelf life of up to 12 months at room temperature.

The following handling conditions were tested:

Table 6: Tube storage conditions for samples tested with HLA Assay 1

Storage condition	Time points	Groups	Blood storage condition	Subjects	Assay concordance
25°C	12, 13 months	6: 3 lots per time point	14 days at 18–25°C	24 (12 per time point/group)	100% (72/72)
25°C	7, 13 months	2: 1 lot per time point	14 days at 18–25°C	24 (12 per time point/group)	100% (24/24)
25°C with temperature cycling for 10 days at 45°C and 5 days at −20°C	7, 13 months	3: 1 at 7 months and 2 at 13 months (temperature cycling at 6 and 12 months)	14 days at 18–25°C	24 (12 per time point/group)	100% (36/36)

DNA concentration and purity were assessed for the PAXgene Blood DNA Tube using a commercially available, automated magnetic bead based DNA extraction kit (elution volume: 200 µl). DNA concentration was ≥ 15.2 ng/µl and DNA purity was between 1.7–1.9 for all samples.

5. DNA Stability – Whole blood storage in tube

Stability of blood stored in the tube was tested for DNA concentration and purity, as well as HLA Assay 2 concordance with a control EDTA tube. DNA was purified using a commercially available, automated magnetic bead based DNA extraction kit (elution volume: 200 µl). The data supports storage of blood in the tube for the following conditions:

Table 7: Whole blood storage conditions and assay results

Storage time	Storage temperature	Sample size	Concentration (ng DNA / µl eluate)	Purity (A_{260}/A_{280})	Assay concordance	95% CI lower bound
0, 3, 7, 14 days	18–25°C	12	≥ 17.5	1.8–1.9	100% (48/48)	92.6%
0, 14 days	18–25°C	60	≥ 16.7	1.7–1.9	100% (120/120)	96.9%
0, 7, 14, 21, 28 days	2–8°C	12	≥ 13.4	1.8–1.9	100% (36/36)	90.4%
0, 28 days	2–8°C	60	≥ 16.3	1.7–1.9	100% (120/120)	96.9%
0, 1, 6, 12 months	−20°C	12	≥ 15.3	1.8–1.9	100% (48/48)	92.6%
1, 2, 3 freeze-thaw cycles	−20°C / 18–25°C	12	≥ 16.1	1.7–1.9	100% (24/24)	86.2%
1, 2, 3 freeze-thaw cycles	−20°C / 18–25°C	60	≥ 13.1	1.7–1.9	N/A	N/A
6 hours, 1, 2, 3 days	35°C	12	≥ 14.1	1.7–1.9	100% (60/60)	94.0%

DNA concentration and purity were assessed for the PAXgene Blood DNA Tube using a commercially available, automated magnetic bead based DNA extraction kit (elution volume: 200 µl). DNA concentration was ≥ 13.1 ng/µl and DNA purity was between 1.7–1.9 for all samples.

6. Interference

Potentially interfering substances were added separately to the PAXgene Blood DNA Tube. The addition of these substances did not have an effect on the FDA cleared assay performance (HLA Assay 3). All samples were concordant with a PAXgene Blood DNA Tube from the same subject without the added substances and control EDTA tube. The following substances were evaluated, using both a commercially available, automated magnetic bead based DNA extraction kit and a commercially available, automated silica membrane based DNA extraction kit:

Table 8. Interfering substances – Concentrations tested

Interfering substance	Hemoglobin	Bilirubin	Triglycerides	Albumin
Concentration	200 g/L*	200 mg/L†	18.2 g/L†	27.4 g/L†

* Total concentration includes endogenous and added hemoglobin
† Concentration of interferent added to sample

DNA concentration and purity were assessed for the PAXgene Blood DNA Tube with potentially interfering substances in comparison to the PAXgene Blood DNA Tube with no potential interferents, using both a commercially available, automated magnetic bead based DNA extraction kit (elution volume: 200 µl) and a commercially available, automated silica membrane based DNA extraction kit (elution volume: 100 µl):

Table 9. Interfering substances – Study summary (magnetic bead based DNA purification)

Interfering substance	None	Hemoglobin	Bilirubin	Triglycerides	Albumin
Sample size	10	10	10	10	10
Concentration (ng DNA / µl eluate)	≥ 69.0	≥ 59.2	≥ 58.8	≥ 44.6	≥ 43.6
Purity (A_{260}/A_{280})	1.8–1.9	1.8–1.9	1.8–1.9	1.8–1.9	1.7–1.9
Assay concordance	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)

Table 10. Interfering substances – Study summary (silica membrane based DNA purification)

Interfering substance	None	Hemoglobin	Bilirubin	Triglycerides	Albumin
Sample size	10	10	10	10	10
Concentration (ng DNA / µl eluate)	≥ 28.2	≥ 27.0	≥ 29.2	≥ 34.4	≥ 24.0
Purity (A_{260}/A_{280})	1.7–1.9	1.7–1.9	1.8–1.9	1.7–1.8	1.7–1.9
Assay concordance	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)

DNA concentration was ≥ 43.6 ng/µl for magnetic bead based DNA extraction kit samples and ≥ 24.0 ng/µl for silica membrane based DNA extraction kit samples. DNA purity was between 1.7–1.9 for all samples.

7. Sample Handling – Mixing and Underfilling of Tubes

Robustness of DNA from samples subjected to a range of handling conditions was tested for DNA yield, concentration and purity, as well as HLA Assay 2 concordance with a control EDTA tube. DNA was purified using a commercially available, automated magnetic bead based DNA extraction kit (elution volume: 200 µl). The following handling condition were tested:

Table 11: Whole blood handling conditions and assay results

Handling	**Test conditions**	**Subjects**	**Concentration (ng DNA / µl eluate)**	**Purity (A_{260}/A_{280})**	**Assay concordance**
Underfilling	2.5 ml, 1.25 ml, 0.70 ml	10	≥ 16.7	1.8–1.9	100% (30/30)
Mixing	0, 1, 5, 8 tube inversions	10	≥ 16.8	1.8–1.9	100% (20/20)

DNA concentration and purity were assessed for the PAXgene Blood DNA Tube using a commercially available, automated magnetic bead based DNA extraction kit (elution volume: 200 µl). DNA concentration was ≥ 16.7 ng/µl and DNA purity was between 1.8–1.9 for all samples.

Substantial Equivalence	Based on a comparison of the device design, operational use, and the intended use and performance for venous whole blood specimen collection, anticoagulation, stabilization, transportation and storage for the preparation of human DNA, the PAXgene® Blood DNA Tube is as safe, as effective and performs as well as the commercially available predicate device, the BD Vacutainer® PPT™ Plasma Preparation Tube. For the specific intended use, the PAXgene® Blood DNA Tube is substantially equivalent to the predicate device.